Amendments to the Claims:

1. (Currently Amended) A ridge waveguide ~~filter~~ having a slow-wave structure comprising:

an elongate hollow tube define by conductive sidewall, the elongate hollow tube having a first characteristic impedance;

~~and~~ at least one ridge protruding from a first part of the conductive sidewall into the hollow tube and extending along an elongate direction of the hollow tube; ~~, wherein the ridge is partitioned by~~ and

a plurality of trenches partitioning the ridge into a plurality of ridge segments such that the ridges and the trenches form a transmission line with a second characteristic impedance, wherein the transmission line is operative to slow down a wave propagating therethrough, and the second characteristic impedance is no smaller than the first characteristic impedance.

2. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 1, wherein the sidewall is fabricated from metallic materials.

3. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 1, wherein the hollow tube includes a rectangular hollow tube.

4. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 1, wherein the hollow tube includes a circular hollow tube.

5. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 1, wherein the ~~ridges~~ ridge segments are equally spaced from each other.

6. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 1, wherein the ~~ridges~~ ridge segments are parallel with each other.

7. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 1, wherein each of the ~~ridges~~ ridge segments has a bottom surface parallel with a second part of the conductive sidewall.

8. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 8, wherein the second part of the conductive sidewall is opposite to the first part of the conductive sidewall.

9. (Currently Amended) A ridge waveguide ~~filter~~ having a slow structure, comprising:

an elongate hollow tube defined by a conductive top wall, a pair of conductive sidewalls, and a conductive bottom wall, the elongate hollow tube having a first characteristic impedance; and

at least one series of ridge segments protruding from the conductive top wall into the hollow tube and extending along an elongate direction of the hollow tube; wherein

each of the ridge segments has a pair of opposing side surfaces parallel to and separate from the conductive sidewalls of the hollow tube~~;~~ and is spaced from the ridge segment adjacent thereto by a distance to result in a second characteristic impedance equal to or larger than the first characteristic impedance.

10. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 9, wherein the conductive sidewall includes a rectangular cross section.

11. (Cancelled).

12. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 9, wherein the ridge segments are separated from each other by a plurality of trenches have a depth the same as a height of the ridge segments.

13. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 9, wherein the ridge segments are aligned to each other.

14. (Currently Amended) The ridge waveguide ~~filter~~ of Claim 9, wherein the ridge segments are equally spaced from each other.

15. (Original) A method of forming a ridge waveguide filter having a slow-wave structure, comprising:

a) forming a body portion of an elongate hollow tube, wherein the body portion has an open top;

b) providing a planar plate having a first surface and a second surface opposite to the first surface;

c) pressing the first surface to form a ridge recessed from the first surface and protruding from the second surface;

d) processing the second surface to form a plurality of trenches recessed from a top surface of the ridge; and

e) covering the open top of the body portion by attached the planar plate to the body portion, wherein the second surface of the planar plate faces the body portion.

16. (Original) The method of forming the ridge waveguide filter of Claim 15, wherein step (c) comprising forming a body portion of an elongate hollow rectangular tube.

17. (Original) The method of forming the ridge waveguide filter of Claim 15, wherein step (a) comprising forming a body portion of an elongate hollow tube from conductive material.

18. (Original) The method of forming the ridge waveguide filter of Claim 17, wherein step (b) further comprising providing a conductive planar plate.

19. (Withdrawn). A method of fabricating a ridge waveguide filter having a slow-wave structure, comprising:

a) forming a conductive body portion of an elongate hollow tube, wherein the body portion has an open top;

b) providing a substrate;

c) etching the substrate to form a plurality of trenches in the substrate;

d) plating the etched substrate with a layer of conductive material; and

e) attaching the layer of conductive material with the conductive body portion.

20. (Withdrawn). The method of Claim 19, wherein step (a) comprises providing a silicon substrate.

21. (Withdrawn). The method of Claim 19, wherein step (c) comprises etching the substrate with a plurality of trenches parallel to each other along an elongate direction of the hollow tube.

22. (Withdrawn). The method of Claim 19, wherein step (d) comprises placing the layer of conductive material conformal to an etched surface profile of the substrate.

23. (Currently Amended) A method of maintaining a characteristic impedance of a slow-wave structure of a waveguide operating at a certain frequency, comprising:

a) processing a top wall portion of the waveguide to form a ridge extending into the waveguide along an elongate direction of the waveguide; and

b) processing the ridge into a plurality of ridge segments separated from each other by a gap, so as to effectively introduce a plurality of inductances between the ridge segments, which themselves capacitively couple to a bottom wall of the waveguide, such that the ridge segments and the gaps form a transmission line operating in such a way as to slow a wave propagating down the waveguide; and

c) configuring the gap to increase a characteristic impedance of the transmission line when a wave traveling therethrough.

24. (Original) The method of Claim 23, wherein step (a) further comprising forming the ridge with a bottom surface parallel to a bottom wall portion of the waveguide.